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Farm Computer Software



How To Evaluate Software For Your Own Use

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How to Evaluate Farm Computer Software

Foreword

Across North America over 300 software developers, including individuals, private companies, universities and governments, have identified many functions in a farm business which could benefit from micro computer program. Well over 1,000 different programs are available for almost 100 different makes and models of computers. While only a small portion of this number will apply to a farm operation, the choices are still numerous.

Evaluating and purchasing a computer system firstly requires an evaluation of the farm and its needs for information and secondly an evaluation of the software packages that are available. The purpose of this publication is to provide a guideline for evaluating computer software as well as general information on farm accounting packages.

This publication was prepared by Doyle Wiebe. The assistance of many resource people and reviewers is gratefully acknowledged.

For further information or additional copies of this booklet contact your agricultural representative, regional farm management specialist or the Farm Management Section of Saskatchewan Agriculture, Room 329, Walter Scott Building, Regina, Saskatchewan, S4S 0B1

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A. Introduction

i) Purpose of Bulletin

Over the past several years many books, articles in the newspapers, and magazines, and publications that deal specially with computers have been printed. The information provided covers all aspects of the computer industry. This publication is designed to provide a guide for evaluating and selecting a software package for your farm business.

Most farmers would find it difficult to identify what a computer could actually do for their farm business. The first and most important step in determining what a computer can do for a farm business is to identify the needs of the farm business. The second step is to evaluate the computer and software packages in terms of those needs. This publication will outline methods to identify the needs of your farm business and will provide a set of criteria that should be used in evaluating software package.

Two accounting software packages available to Saskatchewan farmers are used for example purposes. The characteristics of these packages are only being identified for examples and are not being actually evaluated. There are several more accounting packages available as well as other software packages which should be considered on their own merit based on the criteria outlined in this bulletin.

ii) Why Computers on Farms

The many advances in the mechanical, technical and production aspects of the farm operation have virtually by-passed the farm office except for leaving higher piles of information to sort through. The time required to just do the basic bookkeeping has increased dramatically and this function is only one of many office type functions a farm manager must do. Sorting through the massive amounts of information on new equipment, chemicals, crops, medicines, etc., is a time consuming task. Collecting, sorting and analyzing production information, such as livestock growth characteristics or pedigrees, to determine what is and what is not making you money, is another area that is often not considered because of the large amount of time required to glean out useful information.

Computers are specifically designed to perform repetitive tasks for compiling and analyzing massive amounts of data very quickly and accurately. As the nature of the farm business has become more complex, decisions involve more factors and are more critical to success. In many cases, the information provided by a computer can

reduce the risk associated with a decision. A rule of thumb, though, is that a computer will not make a good manager out of a poor manager, but will enable a good manager to become a better manager.

For computer use to be successful in your operation you must be interested in what the computer can do and be prepared to put up with the problems and frustrations that will almost inevitably occur in getting the system up and running. These problems can be minimized by gaining a good knowledge of your alternatives and dealing with reputable hardware and software companies.

Computers in the business world are performing more and more functions to make businesses more efficient and profitable. As the management of a farm becomes more demanding, computers will be used to improve the quality of information needed to make the farm more efficient and profitable.

iii) Why Evaluate Software

Without a good program (software) the benefits from the computer system may be very small. It could be compared to drawn equipment on your farm. If the equipment is poorly designed and prone to breakdowns, all the money in the world spent on the tractor will be useless. Unlike farm equipment, however, not all programs can be driven by the same hardware. Purchasing hardware first will limit you to looking at only programs which will run on your hardware. The best programs for you may not work on your hardware.

The above comments assumes you are mainly looking at a computer system to meet farm **business** needs. If you have purchased or are intending to purchase some particular computer model for educational or recreational purposes, such as the same computer as your children are using in school, do not dismay. These are often good reasons for the purchase. However, do not expect then that all of your business needs can be met. Much of the educational and recreational software is not designed for the same hardware configuration as business software.

Finding the best programs for your needs is an increasingly difficult task. Across North America over 300 software developers including individuals, private companies, universities and governments, have identified many functions in a farm business which could benefit from micro-computer programs. Well over 1,000 different programs are available for almost 100 different makes and models of computers. Although only a small portion of the total number will apply to you, the choices are still numerous for anyone trying to fill their needs.

Another problem is that anyone can put software on the market. There are virtually no restrictions or regulations governing the quality of software being made available. Few industry standards have developed to this point. The result has been a wide range in quality from very poor to excellent along with price from very low to very high. The two, quality and price, are not **always** parallel.

It is the buyer's responsibility to evaluate the pros and cons of any program. To do this evaluation effectively the buyer must have some idea of what to look for. Purchasing a complete computer system for your farm will require a significant investment. Therefore it is important to learn as much as possible about computers and software before making a commitment.

iv) Application Software vs General Use Software

Software or programs will determine the type of functions that a computer system will perform. Software can vary from being very specific to being very general. If you want the computer to perform a very specific function and only that, you would likely have to write the program yourself. This involves a lot of training, time and frustration which is appealing to some people but the vast majority would not use a computer at all if they had to program it.

Application software refers to software programs written for one specific purpose (application). The computer user enters the appropriate data and the program will process it in a predetermined way. A farm accounting program is an example of application software. The drawback for this option is that everyone seems to have slightly different needs. If the program available is totally inflexible you either have to sacrifice some of your needs, or continue to search for a program that will meet your needs.

Even though there are hundreds of application programs available for agriculture, there are still many applications not specifically addressed by developers. As demand warrants, application programs will be developed. If you require a program that is not available, a General Use program may enable you to design your own program.

General Use software are programs which have no predetermined applications but have built in processing capability.

"General Use" software falls into 2 primary categories. Firstly, "Spreadsheet" programs, including brand names such as Visicalc, Multiplan, Lotus 1-2-3. These programs are primarily used for simulation (planning) purposes. Secondly, "Data Base Management Systems (DBMS)" programs. Brand names such as Profil, DBase 2, PFS and a lot of others, are used for record keeping applications.

Since there are an increasing number of these program available with a range in price from \$100-\$2000, it would be wise to also know what you are actually getting for your money. It can easily be as much a mistake to buy too little capability as too much capability, particularly for DBMS.

There are many characteristics in evaluating "General Use" programs which are different from those for "Application" programs. Since the experience of new users to date is most commonly in favor of using application software this bulletin will mainly apply to application software.

Another publication of this type may be forthcoming to deal exclusively with consideration of "General Use" software. In the meantime, a good starting reference would be the manual published by Wascana Institute (See Appendix III).

B. Background

A brief look back in time may help to better appreciate where the computer industry stands now and what may develop in the future.

i) Hardware

Since the 1950's, when tube type computers completely filled large rooms and only performed simple repetitive functions, improvements in computer technology has occurred in two forms. Firstly, size and internal capacity progressed in opposite directions. Transistors and then silicon chips allowed these monstrous machines to be condensed in size at the same time as dramatically increasing capacity. The desk top micro-computers today have ten times the power of a computer which filled a whole room 30 years ago.

Secondly, technical advances in the other equipment required for a balanced system were also great. The advent of floppy disk drives to allow fast access and storage of large amounts of data, television type screens for much quicker input, editing and visual analysis, and small fast printers for permanent records have continued to increase the capacity and usefulness of a micro-computer.

ii) Software

Along with more sophisticated hardware has come a multitude of software (programs). Ironically, as programs become more sophisticated computers become **easier** to use. At first data had to be entered by trained computer operators because errors could easily be made and the computer did not have the capacity to allow checking of errors

before processing. Today, English language commands and simple operation routines allow almost anyone to operate a computer particularly if they are familiar with the information they are putting in and trying to get out of the system.

Computer programs and agriculture have been associated for over 15 years. One of the first areas of application, farm accounting, which is still the most common application, was initiated by the universities and governments in the 1960's through a service known as the "Canfarm" accounting service. It offered a comprehensive accounting system requiring the farmer to mail data to Guelph, Ontario for processing with reports mailed back. Canfarm is still in operation, based now in Montreal, and run as a private business making use of a combination of micro-computers for data input and a main-frame for processing.

In addition to Canfarm, Farmwest Management of Saskatoon and Farmfax Management System of Raymore also offer a mail in type computerized accounting service making use of both micros and larger computer systems. Looking at what is offered through these services may also help you understand what a computer can do for you.

Governments and universities are involved with program development for micro computers to some extent. Some of these programs are available upon request. Specialized programs for decision making which only a few farmers will use, or programs to assist extension staff when working with a management problem with the farmer, are being developed.

Private individuals and development companies have identified many other areas of the farm business as requiring various types of record keeping and management aiding programs. Since program development costs are high, the vast majority of these programs are developed for applications common to large groups of farmers. These programs are generally developed for users that are familiar with the data and objectives of the programs.

iii) Jargon

As new technology develops, new words are used to describe various aspects of the technology. Some of the words are acronyms (words for abbreviations of a phrase) and some just become commonly used by the industry with new meanings for old words. A longer list is available in Appendix I of words you will likely hear as you shop around. A few are offered here which are being used in this bulletin.

Data -	Facts & Figures in an incomplete form
Information -	Facts & Figures in a complete and useful form for decision making
Hardware -	Is the physical items you will see as part of a computer system. (Keyboard, screen, central processing unit (C.P.U.), disk drive and printer)
Software or Program -	The instructions used to tell the computer what to do. Software and programs are synonymous
Storage -	A word used to refer to the filing cabinet aspect of the computer's function
Diskettes -	The storage mechanism most common with micro-computers. Diskettes are to the computer what paper is to a pen.
Disk Drives -	Hardware that records data on a diskette.
Prompts -	Helps the operator of a program know what information should be entered. A prompt will appear on the screen.
Screen or Monitor	This is similar to a small television set. It provides a visual display of either data being entered or information being produced.
Printer -	Similar to a typewriter, a printer will print information on paper for a permanent record.

C. Considerations for Evaluating Farm Application Software

i) Determining Your Needs

Before seriously looking at a personal computer system, it is important to ask yourself the question "What part(s) of my farm business functions can benefit most from computerization?" This can be a very difficult question to properly answer if you do not know what a computer can do.

In very simple terms, a computer is no more than a calculator and a filing cabinet which cannot do anything you cannot do manually. The calculator function is referred to as computation (hence, "computer") and the filing cabinet is the storage mechanism. "So what's so great?" you ask. Well, the main answer is speed and another is flexibility.

With proper instructions, a micro-computer can access information from many files, make calculations, output the information and store the results in another file, all in a matter of seconds. Its flexibility is similar to a record player, where you can play rock one minute and country music the next. A computer can do bookkeeping one minute and calculate the best ten percent of your cow herd the next. It can only do this, though, if you have "inputted" the necessary data and have a program to instruct the computer what to do with it.

To the question "What can a computer do for me?" most farmers would answer "Accounting" as it is one area common to all farmers and the one most often talked about with computers. However, in some cases, the accounting function may already be taken care of adequately by an existing manual system, a computerized service or an accountant. Improvements can likely be made which could benefit your accounting system, however, they alone may not justify the purchase of a micro-computer system. There may be other areas of your operation which could benefit. For example:

- A grain producer may need software to keep track of inputs such as fertilizer and residual herbicides used on various crops and fields for long rotations.
- A seed grower may need detailed historic land usage records along with customer information and correspondence.
- A commercial beef breeder may need to sort out which bulls and cows are producing the best and worst growing calves.

- A commercial feedlot operator may need to foresee cash flow based on future prices of feed grains and livestock.
- A hog producer may need to correlate days to market and litter size with the boar and sow for selection and culling purposes.
- A milk producer may be able to improve production with daily analysis of individual cow production and breeding information.
- Any farmer with various investment and borrowing alternatives may need detailed simulation programs to predict tax and cash flow implications of these alternatives.

In many cases, accounting records and analysis may still prove to have the most potential benefits. To help determine what is most important to you, look at the paperwork you are doing now. Determine which of the five categories identified in the next section best describes the type of paperwork you find yourself either doing now or wish to do. A lot of record keeping and analysis is not being done due to the amount of time it takes to produce useful information. Consider what information or analysis could be important to you if you had a way of getting it more easily. If you are only keeping financial records for the Tax purposes, computerizing them may not benefit you very much.

Once you have prioritized your general needs, look specifically at the first priority and the data you want a program to process into information.

Take time to write down what data you wish to input and what information you want to get out. There is always a balance of the two in any program which must be adhered to. Your list of information can only be achieved if the necessary data is available and if the program is designed to process it.

For example, for a basic accounting program:

<u>Data Required</u>	<u>To Provide</u>
Operating transactions	- Income/Expense Statement
All bank transactions	- Cash Flow Statement
Inventories, assets, depreciation, liabilities	- Net Worth Statement
Designate enterprise for transactions and assets	- Enterprise Analysis
Budget	- Comparison of Actual to Budget

Your list may change as you see programs operate and how easy or how difficult it is to input certain data. However, an initial list is necessary as a starting point.

Every software package available for a particular application, has been designed to meet slightly different informational requirements. You must decide which programs come closest to meeting your needs by evaluating the pros and cons of each. You can only make a good buying decision after you can evaluate the good and poor features of each program.

ii) Categories of Software Applications

To determine the type of software most valuable to you, consider the following five categories of farm business applications. These categories have been identified by software developers, as having potential benefits from computerization on farms. Every farm has some requirements in each category but the emphasis will vary.

(a) Financial Records - In addition to keeping track of income and expenses for tax purposes, these programs may also provide for inventory changes, capital asset transactions, accounts payable, accounts receivable, loan information, personal income, cheque writing and budgets to produce reports such as income and expense statement, cash flow statement, net worth statement, tax schedules and projections.

(b) Production Records - Since every farm produces something, information on how the production came about and details on the production itself can be very useful. R.O.P. (Record of Performance) information for livestock has had a recognized value to the owner or buyer of the select animals for many years. Detailed annual information on the production of livestock or grains can become very useful in developing budgets, land rotations, culling and selecting breeding stock.

Massive amounts of information are actually available but generally go unrecorded due to the time required to do any useful analysis. For example, calculating the average yield of stubble wheat on ten different fields over the past ten years, or comparing the average daily gain of the 100 calves from each of three different bulls over the past four years manually will require allot of time.

The computer can reduce the time required to process and print a report to a few minutes. However, an equal amount of time gathering and inputting the data as for a manual system must be spent. The cost of this time must be evaluated in terms of the value of the information being made available for decisions.

(c) Decision Making Aids - A large number of factors are involved to make any major change to your production system. Programs have been designed to allow you to determine the effect of

various decisions or events on your farm before the decision is implemented. The "What if ...?" question can be answered by using these programs for budget, tax, crop planning, etc.

For example:

- What happens to my net income if the yield is 20 percent below average?
- What if I buy or lease some new equipment?
- What may happen to my cash flow and net income if I stubble crop?
- What if I buy the land for sale by the neighbour?

These type of questions are being asked more often and the answer is often critical to the success of your farm operation. There are still factors you cannot forecast, like the weather, however the more factors you can account for, the more likely a good decision will be made.

Since many of these programs are only used very seldom, by any one farmer, the private software developers have usually stayed away from developing them. The universities and provincial governments, however, have put the technical expertise required toward development of these management decision-aid programs. Most of these are considered "Public domain" software whereby they are available upon request at a small fee. Some are also available through computer stores.

An increasing number of decision making programs are being used by your advisors to help you. Some bank agrologists, management consultants and extension specialists are or soon will be using these types of programs to better advise you on what to do.

Remember: The purpose of a computer is **not** to make the decision for you. Rather, by providing a better analysis of historic records along with use of certain assumptions, a computer can give you a better idea of **what may occur if** a certain decision is made. The decision is still up to you, the farm business manager.

(d) Communications - To make some programs available, like the decision making aid programs discussed above, and to provide up-to-date information, agricultural communications data-bases are being developed. Most micro-computers today have some capabilities to use phone lines as a carrier of information from almost anywhere in North America. The micro-computer can be turned into a terminal connected to large computers which have information updated daily on such things as markets, weather, herbicides, pesticides, equipment for sale, etc. The cost is generally based on how long you access the data base

and the value the source has placed on various types of data. Specialized software for a micro-computer is required and depends on the type of data base.

At present, the value of being able to communicate with data bases is relatively low because of a lack of valuable agricultural information. However, there's no doubt valuable information will become available. In Saskatchewan, the "Agritex" service through SaskTel allows you to connect to an increasing number of data bases in North America. In the future, governments, farm supply and equipment companies, etc. will provide information to farmers using Agritex.

(e) Other Business Applications - Depending upon the nature of your business dealings and the amount of time you spend with community and farm organizations, a computer in your farm office may free up a good deal of time to be spent doing more leisurely activities. Word processing and mail list programs can be used very effectively to update and send letters, price lists, meeting minutes, etc. to seed or livestock customers or members of an organization. The financial record keeping and budgeting function need not be restricted to only the farm business. Financial records for home, church or community organization may also be kept on the same computer.

D. Purchasing A Software Package

i) Where to Look

A common comment made by people interested in farm software is that they don't know where to look to see what's available and get good advice. There are several sources to consider. Check out as many of the following sources as possible.

(a) Computer Stores - This is the most obvious source and is a good starting point. Find out what's available in your local area. A demonstration will help you see the way the program operates as well as indicate how knowledgeable your local dealer is. Most retailers are not specialists in agricultural software and do not necessarily need to be. Find out the program manufacturer's name and location and contact directly for more detail on what is available. At this stage you are only checking out what is available. Do not make any commitments yet.

(b) Software Manufacturers or Distributors - Due to the unique nature of farm software, some computer retailers may wish to refer you directly to the software company for information, training and support. There are

several manufacturers within Saskatchewan (For a list refer to Appendix III). Most manufacturers are visible at farm shows or representatives may meet with you at your convenience. Most software is not developed by hardware companies even though some of the software is endorsed by them. For software manufactured outside Saskatchewan, a knowledgeable distribution system should be available within the province to provide necessary information as well as service and support later.

(c) Publications & Magazines - These are numerous. Detailed ads, articles or evaluations may add some useful information to what you already know about a package or tell you where a new package is available. Ads, however, are very general and only should be used to get the address of the distributor. Buying without seeing is often a waste of money. Copies or subscriptions of publications are usually available at computer stores. Appendix III has some addresses of farm computer publications.

(d) Other Farmer Users - A good question to ask the retailers or manufacturers is for names of others in your area who are using the program you're looking at. Their experiences while learning and using the program may help you a great deal in deciding and preparing to use the program. Without prying into confidential information, find out what aspects of the program they are finding most useful, how long it took to learn, how to use it, how they like it generally and what they might have done differently if they were to do it all again.

If the program is a new product, the manufacturer should have a few farmers test the program before selling the first version. If the program has not been tested, there will likely be problems with it. Be sure that the manufacturer will be available and accept the cost of any modification that may be needed to the program.

(e) Business Contacts - Your accountant or banker for example, may know of a financial program which will most closely meet your needs. For production records, speciality livestock or grain producer groups may be a good source of information.

(f) Governments and Educational Institutions - Extension staff from the provincial government and Universities of Saskatchewan may be familiar with some programs. Some farm management software has been developed by the University of Saskatchewan with much more developed by Alberta Agriculture in Olds, Alberta (See Appendix III). Courses are planned each winter by many Community Colleges with advanced courses also being made available to

deal more specifically with farm software. Contact your local Community College representative.

ii) When to Look

Planning ahead is a good practice. Particularly for your first system, ensure that you will have time to:

a) Make a Wise Selection - Sorting through information manuals and getting demonstrations may take some time to do properly. There are many factors involved as discussed throughout this publication and to appreciate them will take some time.

b) Learn how to use it - Do not expect to just sit down and start using the program. Manuals are written for a reason and should be read through before using the program to get a better concept of the capabilities of the whole package. Thoroughly reading a good manual will save a lot of time in getting started.

c) Set-up and enter the basic data - Depending on the type of program and how it works, it could take quite a while to set-up the system. For example: An accounting package requires the user to name all the income/expense, capital asset, liability and inventory accounts before any values are entered. The advantage is that the set only has to be done once. Whenever historic records are required for analysis, they must be entered meticulously into the computer system before reports are produced.

The final recommendation, therefore, is to start the buying process long before you require the results. Do not start shopping in March for accounting packages to be used to get information together by late April for the income tax deadline.

iii) What to look for

To avoid a lot of frustration and a computer program or even a complete system that ends up collecting dust, knowing what to look for and what questions to ask about a program is very important. There are as many ways to perform a given function on a computer as there are people to program it. To perform accounting functions for example, at least 20 different programs are available to Saskatchewan farmers and each is somewhat different.

a) General Considerations

1. What the program does - assuming you have a good idea of what you want a program to do and certain minimum requirements, get an overview of what the program does and

compare it to your list. This should help you shorten the list of possibilities and save you time analyzing programs that you wouldn't want. For example: If you do not want a full double-entry accounting system using debits and credits, then you could eliminate a good number of programs from the list of possibilities.

Brochures or fact sheets briefly outlining the basic functions of a program are usually available and are a good starting point at this stage.

2. Subject Knowledge Requirements - In order to operate the program, do I need to know a lot about how the program works, what and how data goes in. For example: Do I need to know all the complexities of double entry accounting or the income tax system or does the program simplify it for me? The answer should come from seeing the program operate and talking to other users.

3. Special Training Requirements - Is special training required? If so, is it available and at what cost? This consideration will be somewhat dependent on the answer to the previous question. However, some programs and manuals are designed for you only to use after you have been given some personal training. In some cases, this training is included in the purchase which does increase the cost but may reduce the time needed to learn how to use it effectively. If you are looking at your first program, some personal instruction or group workshop will be well worth paying for.

The cost of most packages only includes the amount of instruction time required to get you familiar with the package. A general computer retailer will not likely know the detailed operating instruction for all software packages. More information can be obtained by having the store arrange for a software representative to either visit you or meet you at the store. You may have to pay for this service but it will be a good investment.

Find out from the distributor what the experience of new users has been. If training is necessary, they will usually indicate the amount of training needed. Most distributors would prefer to start you off correctly rather than having to solve a number of problems later.

4. Operator's Manual - Regardless of how much training you receive or how good the program is, a good manual is very important. Without using a program every day you will forget certain things. Having to call a distributor every time you use the program or have a question will be both frustrating and costly.

A good manual, will make it easy to find answers to the detailed workings of the program, through the use of indexes, glossaries, and tutorials with a lot of examples of input and output routines. Without a good manual and taking the time to study the manual you may become disenchanted with the program or only use a small portion of what otherwise may be a very powerful package. A manual should contain:

- Main Index (Table of Contents) - a general breakdown of what the manual contains with page numbers.
- Detailed Index - this should be at the back of the manual containing important words in alphabetical order with page numbers where these words are found in the manual. It is used primarily for problem solving.
- Diagrams of Input - to help you know what exactly to do, samples of what you see on the screen is very useful.
- A Tutorial - to allow you to enter sample data while you're getting familiar with the program. Some packages include sample data on a demo disk. Others show sample entries in the manual you may want to try.
- Sample Output - a sample of all the reports you can produce should be included, so you know what and how information is provided to you with the specified input.
- A Quick Reference - Programs are using more special Function keys to increase the speed of operation. These can be easily forgotten. A quick reference that spells out all the "conventional" uses of certain command keys for a particular program, will make the use of a program easier.
- Glossary - if new words must be used in the manual, a glossary of definitions should accompany the manual.

A manual should provide enough information so that the program can be understood without seeing it operate. If not written well it may indicate the program is not well written either.

5. Contract Conditions - As when buying any piece of equipment, a contract is signed detailing the responsibilities of the two parties. Computer software is something quite different and particularly for more expensive packages, the "Fine Print" should be read before signing the contract.

- License - Most commonly, the sales contract you sign when purchasing a program is actually a lifetime lease. Under the copyright

laws established to protect the software company, you are only given the right to use the program and its documentation. You do not own the program and various restrictions on what rights you do have can be contained in the documentation or the sales contract. Usually strict copying restrictions are included in the contract and possibly some restrictions on what hardware can be used to run the program. Check on the right to make copies for your own or others' use, or even to sell the program to someone else. You should be either given two program disks or the ability to make back-up copies so you will always have a good program disk available.

- Warranties - Repairing or fixing software requires technical expertise. Therefore the type of warranties and guarantees offered by the manufacturer or vendor is quite important. Most warranties have several conditions and are commonly at the beginning of the manual. Common conditions include:

- The exact hardware configurations required.
- Operating system software requirements
- The user is solely responsible for the suitability of the program application
- The user is responsible for consequences of misuse or tampering with the program.
- The program may or may not operate error-free.

Most manufacturers will replace flawed program diskettes and correct program bugs. Check on time restrictions to the warranty and the past performance of company.

- Updates - even though it may not be in writing, it can be important to find out about the manufacturer's policy on updates to the program. There are three different reasons for possible updates:

Firstly, program bugs - an error may be discovered in the program after it is released which may cause problems under certain conditions. Similar to automotive industry "Recalls" you may be advised on the potential problem and either told how to avoid the problem, fix it yourself or the procedure to have the problem corrected. Check on what the company has done with "bugs" in the past.

Secondly, new features may be added to your program and made available on request. Various fees may be charged for the exchange of the old for a new version. If the new version only does what the old one did in a better way, the fee should be small. If, on the other hand, the new version allows you to put more information into the system and to get out more reports from the system it will cost more, but usually not as much as buying a completely new program.

For example: a basic accounting program may not allow quantities for a wheat sale to be entered. An improved version may do this as well as keeping your wheat inventory up to date.

If you wish to upgrade to gain the advantage of the new versions, there are two factors you should check. Firstly, make sure the basic and historical information you have on a data disk can be used by the new version so that hours of entering basic information will be saved. Secondly, find out what the improvements are so you can decide whether or not they are extras you can make good use of. For example, if an enterprise analysis feature is added to your accounting package and you only have one enterprise, the value of the feature will be very low.

Thirdly, some of the basic information in a program might have to be updated to provide accurate information to you. The most common examples are income tax estimating and analysis programs. Each year tax laws and rates change, requiring a change to the calculations made by the program. Find out what procedure is used by the company to get these updates into your program and at what cost.

Provisions for updates may not be in the purchase contract but some assurance from the vendor should be given on how these will be handled to avoid future problems.

- Service and Support - Firstly find out where the nearest dealer for the program is located. Secondly determine what the qualifications are of the dealer, or where and who would be responsible for solving any software problems. Qualified personnel will be required to repair and modify each program as well as solve any problems you may encounter when operating it.

6. Hardware and Operating System Requirements - Computer programs can be written in many different computer languages. In addition there are a number of different computer disk operating systems(Dos). Some programs and/or operating system require specialized hardware. Make sure you know what is required to operate the program and the cost of any extras you'll have to buy in addition to the standard hardware configuration. Specialized software is particularly prone to require special hardware accessories.

7. Integrations to Other Programs - As computers and software become more sophisticated, the ability to integrate (i.e. allowing several programs to make use of the same data files) is a more distinct possibility. When memory and storage capacities were limited a few years ago, integration of large programs was impossible.

One of the first and most common integrations in farm programs has been to automatically update inventories of grain, livestock and other assets and liabilities whenever an accounting transaction is entered. A new level of integration is being developed whereby historical financial and production records could be transferred for use in budgeting, or crop rotation planning. Even if you only wish to use the basic program at first, find out what integration is available.

E. Specific Features

If you have followed all the investigative steps to this point, you should have narrowed down your choices to a short list of three or four packages. Since "seeing is believing", arrange for a detailed demonstration, about two hours for an accounting package, in a setting where you can use it after being shown the basics. (Having read the manual ahead of time and prepared data to be entered would be a real advantage at this point). After being shown the basic, enter data and work through the program without too much expert assistance.

Evaluate each program in terms of program design, and personal preferences. Within a group of similar programs, many differences will still likely become obvious. The following discussion, along with the comparative examples from two accounting packages, should help you evaluate each program:

i) User-Friendly Features

The most widely used measure to determine how easy a micro-computer program is to learn and use, is the term "User-Friendly". This term means exactly what it says. How friendly is the program to the first-time user? A micro-computer must communicate back to you both what you have done as well as what you should do next.

User-Friendly features can take up a large part of the program and is the reason why some program developers choose not to have very many user-friendly features. Programming these features in takes time and that means cost. Another consideration developers face is to keep the program as fast as possible. By adding user-friendly features, the program becomes longer and slows down to some degree. A balance between cost, speed and user friendliness must be established by program developers.

User-Friendly characteristics take several forms:

a) Menus - almost all software packages perform several functions, but only one at a time. To make it easier for the user to choose which function to perform next, menus are most often used. Most programs today have this feature. The differences occur in how the various functions are described. All menu choices should be easy to understand and follow.

Complex programs, like farm accounting, will have a series of menus. As you make one menu choice, another menu appears. For example, if you choose the general selection "Statements" on a menu, the list of possible statements will then usually appear on the second menu. The example Figures I and II, shown here are directly from the manuals of the "Settler Computer Technologies Inc. - Enhance Farm Accounting System". Figure III is from "CAPA/DUNNSTAT - Farm Accounting Records Management" (F.A.R.M.).

Figure I

Main Menu

- | | |
|--------------------------|--------------------------|
| A - End Session | I - Personal Tax Data |
| B - Transaction Entry | J - Tax Forecaster |
| C - Financial Statements | K - Year End Routine |
| D - CCA Part XI(11) | L - Identification |
| E - CCA Part XVII(17) | M - File Initialization |
| F - Transaction Listing | N - Tax Form Variables |
| G - Account Maintenance | O - Backup Data Diskette |
| H - Loan Calculator | P - Exit to DOS |

Enter Selection ()

The entire Farm Accounting System is controlled from the Main Menu. This menu is always displayed whenever the system is available for use. To perform any of the operation shown on the menu, type in the appropriate letter then press the Enter Key to verify you selection.

By selecting the letter "C" a second menu shown in Figure II would appear on the screen.

Figure II

Financial Statements

- 1 - To System Menu
- 2 - Select CCA Expense - MAXIMUM
- 3 - Income • Expense Statement
- 4 - Cash Flow Statement
- 5 - Net Worth Statement
- 6 - Liability Listing
- 7 - Capital Asset Listing

Enter Selection ()

Figure III

The Main Menu

The FARM Main Menu is displayed on the screen in two different parts:

```

000=====Main Menu I=====
                                           Option #
Transaction and Journal Updates ..... 1
Account Payable/Receivable Updates ..... 2
Asset/Liability Updates ..... 3
Loan Updates ..... 4
Tax File Updates ..... 5
Month End Statement ..... 6
Profit or (Loss) Statement ..... 7
Balance Sheet (Net Worth) ..... 8
Year End (TAX) Statement ..... 9
Transaction Ledger ..... 10
Cash Flow Budget ..... 11
Tax Estimator ..... 12

```

Your Choice/ Enter for Main Menu II

```

000=====Main Menu II=====
                                           Option #
Transaction Listing ..... 13
Asset/Liability Listing ..... 14
Amortized Loan Tables ..... 15
Metric Converter ..... 16
Car/Mach. Cost Tables ..... 17
Ledger Account Maintenance ..... 18
System Tax Maintenance ..... 19
System Data Maintenance ..... 20
Create New Years Data Disk ..... 21
Year End Clean Up ..... 22
Copy Disk ..... 23
End Program ..... 24

```

Your Choice/ Enter for Main Menu I

All the features available on this system are displayed and entered through these Main Menus.

The above "FARM" program main menu has more detailed choices then does the "Settler" program. By detailing the list of available statements on the main menu, a sub-menu as shown in Figure II is not required. Compare the descriptions and logic of functions performed by each menu selection when comparing similar programs.

b) Prompts - to keep you from having to guess what information the computer wants you to enter, a prompt is used. It is generally in the form of a question with a "cursor" flashing where the next data will be entered. For example: In figure I, the comment on the bottom of the screen was prompting the user to enter a letter from the above choices. To be user-friendly, the prompt should be easy to read and understand. If it simply appeared on the

screen in one corner, you may not know what to do.

c) Error- Trapping and Correcting - Everyone makes mistakes from time to time. It is very frustrating if after you enter one wrong number, you have to go through some complicated correction procedure or even worse, the program quits (bombs) and you have to start over.

A good user-friendly program will ask you to verify entries before going on. If illogical entries were made, such as a word instead of a number, a reason for not accepting the input should show up on the screen and then allow you to re-enter the correct data.

If after an entry is made and an error is detected by the operator, a "change data" routine of some kind should be available and not require a lot of time to make one change.

To evaluate the program for this feature enter some illogical and wrong data to see how it is handled by the programs.

d) Amount of Typing - It is usually assumed that a farm computer operator will not likely be a typist. There are many programming techniques which can reduce the amount of typing required each time an entry is made. The main advantage is the increased speed of making entries. The disadvantage however, is that as the amount of typing is reduced so is the detail on each new entry.

One shortcut used by programmers to reduce typing is to abbreviated commands by just hitting the enter key. A poorly designed program will force you to answer more questions than you may need to and to type in more information than is necessary for that entry. Figure IV and V show what would be on the screen after a financial transaction is entered for the Settler package or Farm package.

e) Consistency - The above features can take several forms primarily due to the personal preference of the programmer. Slightly different prompts or special functions keys in themselves are okay, from program to program. However, within a given program the prompts should be consistent. If one exit key is used one time, and a different key to exit somewhere else, it will be confusing and therefore slow down the operation. The common commands and prompts used throughout a program are called "conventions" or "standards" and should be listed in the first part of the manual.

f) Keeping you informed - At certain points in the operation of a complex program, the computer has to just sit and work internally. The time required to load a program or data for a report will vary a great deal between hardware systems.

Figure IV - Settler - Transaction Entry Sample

	Farm Accounts		Transactions 40	
	Income	Amount	Budget	%
(Key to Exit)		\$8,856.58	\$16,000	55.35
Account No.	100	Qty		
Name	Durum Wheat	56.118		
Date	06/27/84			
Description	SWP 1-4873596			
Amount	\$1,627.25			
Quantity Tonnes	10.3			

Update Account Records (Y/N) Y

This package is a single-entry system that builds in several assumptions to simplify entries for basic transactions. For the Durum Wheat sale shown, as soon as account #100 was entered, the system knew it was "Income", the name "Durum Wheat" and the present account balances for "Amount", "Budget", % (of budget to date) and Quantity (to date) appeared. The "Date" prompt then appeared with the date of the last transaction as a default value if (enter) is pressed. This avoids having to type it in again if it was the same date as the last transaction. The "Description" prompt was next where anything to distinguish this wheat sale from others could be entered (it is optional). The dollar "Amount" of the sale is the next prompt and because it is wheat, it asks also for a "Quantity" (for this sale). (For items such as repairs, the quantity prompt would not appear).

The final prompt to "Update Account Records Y/N" allows you to correct information if it was entered in error. Otherwise it is stored permanently on the disk.

Figure V - CAPA - Transaction Entry Sample

014 -----Transaction and Journal Updates -----						
Batch #:9AA		Lines Left: 49		Side A		(Side B)
Acct: Wheat Sales				1200.00		
Data Correct (Y/N)						

4000		84112		SWP 123456 300		(1200.00)

Acct	SB#	Date	REF/CHQ	Description	Quantity	Amount

1000	1	841121	175	Wheat Sale		1200.00

Figure V shows a completed transaction for a wheat sale on the "FARM" accounting program. This is full double entry system. A double entry system is a more complete and a more accurate record system. Both sides of the transactions must be entered to show where the income came from and where the it was put. In the example shown, Acct. #4000 is for "Wheat Sales" and Acct. #1000 sub #1 is the "Checking Account". Wheat was sold and the money was deposited in account #1000 sub #1.

The FARM program is a somewhat modified double-entry system. Instead of using the terms "Debit" and "Credit", Side A and Side B is used with their meanings explained in the manual. Batches of transactions can be entered which speeds up entries to some extent.

When entering the second part of a transaction, default values are available by using special command keys and thus reducing amount of typing required.

A well designed program will tell you either what it is doing or at least that it's busy and you should not worry. Therefore, do not touch any keys, reset the system or worst of all turn the machine off. Some poorly designed programs simply black out the screen and it looks like it's dead. If the function takes a few minutes, you may think something is wrong when in fact nothing is.

The user-friendliness of a program is at least as important as what the program does. Particularly for your first major package, you will need a very friendly program to maintain your interest and to convince you that a computer can be a useful tool.

ii) Speed of Operation

As mentioned above, the degree of user-friendliness will effect the speed of various parts of the operation of a system differently. A program with a lot of user-friendly features will take longer, to load the program or start-up the system. If most of your time is spent entering new data for future analysis, start-up time won't be as important as entry time. During a

demonstration, keep in mind what you will be doing most often and consider the time it takes to perform those functions.

User-friendliness features are not the only cause of speed differences. Initially data is entered into the memory and is held there until you've finished entering and then stored on disk. This will make entries very fast. However, if after entering many transactions a power surge or failure even for only a split second, could cause these transaction to be lost.

Some programs are designed so that the computer stores the information after each entry. In some cases a printed copy of each entry as it is completed may be automatically done by the system. If entries are slow, determine what the system is doing for you. If the program is poorly designed, it will simply be slow for no definite reason.

The time to produce a report should also be considered. If a lot of pages of information are produced to give you only a few numbers you want, then it will be frustrating, time consuming and provide piles of extra paper you do not want.

When evaluating a program for speed characteristics and comparing it to another, make sure that it is the software and not the hardware speed of operation being compared. New higher priced models of hardware with hard disk drives, for example, and expensive printers may operate 3 - 5 times faster than the system you are contemplating buying.

iii) Reports

After evaluating how the data goes in and the way the program handles the data, the third basic function of any computer program is to provide you with new information in the form of reports. The number and type of reports can vary a great deal and the "user-friendly" features come into this consideration again. There are several questions you should ask yourself when looking at the reporting function of a program.

Are the reports easy to read and the information easy to understand? Some programs try to put too much information on one page making it cramped as well as having to use a lot of abbreviated headings which may be meaningless unless you are very familiar with the system. A title for the report and the date produced are mandatory pieces of information for future reference.

Is the information useful? To be truly information by definition, it should be facts and figures you can use directly for decision making. If you have to make further calculations with a calculator, then the report may not be as useful as possible. Also, there may be a lot of extra information in a report that only makes it more difficult to find what you will usually want. Summary reports may be more useful and that leads to the next question.

How many different reports are available? Are all the reports I need available? Do I have to produce them all or can I choose? Flexibility is the key feature to consider here. Some programs even allow you to determine exactly what type of information you want on a report. This is referred to as a "user-defined" report feature and is particularly important for record keeping. Generally, the more flexibility the better, but it can get confusing until you understand what you need and what you can get.

Are the reports available on the screen and the printer? The option of video or printed reports is not always available, and not always practical either. Several makes of computers do not allow as many columns of information on the screen so certain reports may just not fit. However, it is generally much quicker to check only certain information by just getting a video report so this option can be a valuable option.

Figure VI
Income and Expense Statement

Prairie Farmer

06/27/84

No	Description	Amount	% Inc.	\$ Budget	% Budget	Quantity
100	Durum Wheat	\$ 7,229.33	11.01	\$ 16,000.00	45.18	1,636.40
102	Spring Wheat	6,555.00	9.98	28,000.00	23.41	1,731.00
110	Barley	800.36	1.22	4,000.00	20.01	250.00
120	Rye Sales	0.00	0.00	4,000.00	0.00	0.00
130	Bulls Sold	0.00	0.00	1,500.00	0.00	0.00
132	Cows Sold	3,100.00	4.72	5,000.00	62.00	3.00
134	Steers Sold	0.00	0.00	8,000.00	0.00	0.00
136	Heifers Sold	0.00	0.00	3,000.00	0.00	0.00
150	CWB Payments	30,000.00	45.67	11,000.00	272.73	0.00
154	Hay Sold	18,000.00	27.40	30,000.00	60.00	300.00
178	Pat. Dividend	0.00	0.00	2,000.00	0.00	0.00
	GROSS INCOME	\$65,684.69		\$112,500.00	58.39	

No.	Description	Amount	% Inc.	\$ Budget	% Budget	Quantity
200	Hay Prurchases	625.24	18.03	1,000.00	62.52	10.20
202	Seed Cleaning	66.21	1.91	250.00	26.48	0.00
204	Diesel Fuel	997.78	28.78	6,500.00	15.35	843.00
208	Farm Repairs	126.10	3.64	3,600.00	3.50	0.00
220	Power	252.00	7.27	2,400.00	10.50	0.00
222	Telephone	350.00	10.09	1,200.00	29.17	0.00
224	Gasoline Auto	0.00	0.00	600.00	0.00	0.00
230	Vet/Medicine	0.00	0.00	800.00	0.00	0.00
234	Spray	450.00	12.98	600.00	75.00	4.10
236	Fertilizer	0.00	0.00	4,000.00	0.00	0.00
250	Bull Purchase	0.00	0.00	1,500.00	0.00	0.00
252	Cow Purchase	600.00	17.30	2,500.00	24.00	1.00
254	Heifer Purch.	0.00	0.00	2,000.00	0.00	0.00
256	Steer Purch.	0.00	0.00	1,000.00	0.00	0.00
	TOTAL EXPENSES	3,467.33		27,950.00	12.41	
	CCA EXP PT 17	462.50				
	CCA EXP PT 11	36,978.10				
	NET INCOME	24,776.76				

Figure VII

CONSOLIDATED PROFIT OR (LOSS)

CAPA/DunnStat
Box 257 Kindersley, Sask.Prepared Date: 840125
Period Ending Date: 830630 : Year 1983
FARM by CAPA/DunnStat

Page No: 1

		INCOME			
ACCT DESCRIPTION	THIS MONTH		CURRENT YEAR		LAST YEAR
Wheat Sales			127,000.00	50.2	105,000.00 47.0
Other Grain Sales			39,000.00	15.4	42,000.00 18.8
Cattle Sales			75,000.00	29.6	70,000.00 31.3
Custom Work	300.00	19.3	10,300.00	4.0	5,000.00 2.2
Interest Income	1,254.00	80.6	1,254.00	.4	1,500.00 .7
TOTAL INCOME	1,554.00	100.0	252,554.00	100.0	223,500.00 100.0
		EXPENSES			
ACCT DESCRIPTION	THIS MONTH		CURRENT YEAR		LAST YEAR
<u>PRODUCTION EXPENSES</u>					
Seed Purchases			3,000.00	1.5	2,000.00 1.1
Chemical Purchases			4,500.00	2.2	4,000.00 2.2
Feed Purchases			2,500.00	1.2	2,000.00 1.1
Veterinary Supplies			196.00		200.00 .1
			10,196.00		8,200.00 4.5
TOTAL	0.00		10,196.00	5.1	8,200.00 4.5
<u>FUEL/BUILDING AND EQUIPMENT EXPENSES</u>					
Gas & Diesel Purch.			10,000.00	5.0	9,500.00 5.2
Oil, Grease & Other			500.00	.2	500.00 .3
Small Tool Purchases			596.00	.3	500.00 .3
Building Repairs			784.00	.3	500.00 .3
Repairs & Parts			1,475.00	.7	2,000.00 1.1
TOTAL			13,355.00	6.7	13,000.00 7.1
<u>OVERHEAD EXPENSES</u>					
Land Rental			160,000.00	81.3	150,000.00 82.3
Wages			1,000.00	.5	0.00
Interest	1,000.00	49.0	2,500.00		2,000.00 1.1
TOTAL	1,000.00	49.0	163,500.00	83.1	152,000.00 83.4
<u>UTILITY EXPENSES</u>					
Utilities			3,300.00	1.6	3,000.00 1.6
TOTAL			3,300.00	1.6	3,000.00 1.6
<u>MISC EXPENSES</u>					
Professional Service	700.00	34.3	700.00	.3	1,000.00 .5
Bank Service Charges			56.00		100.00
Miscellaneous	337.00	16.5	4,937.00	2.5	4,400.00 2.4
Charitable Donations			600.00	.3	600.00 .3
TOTAL	1,037.00	50.9	6,293.00	3.2	6,100.00 3.3
Total Expenses	2,037.00	100.0	196,644.00	100.0	182,300.00 100.0
Profit or (Loss)	(483.00)	(23.7)	55,910.00	28.4	41,200.00 22.6

Figure VI & VII are sample income and expense statements from the Settler and Farm programs respectively. There are significant differences in the information provided to the user.

Figure VI shows the Account #, Account description and total amount in account to date. It keeps a running total of the account and not monthly totals. Therefore, only a current amount is shown. The % column simply indicates what percent that account represents of the total. In the example, wheat income is 11.01% of the total income. The system does not store last year's totals but rather allows you to enter the annual budget for that account which is shown along with the percentage of budget to date. In the example, Durum wheat sales are now 45.18% of the budgeted income for Durum Wheat. The accumulated quantity total is also shown. Being a tax oriented system, the Capital Cost Allowance (CCA) expense that will be available at year-end is deducted prior to calculating the net income. (Note: The amount of CCA deducted is optional)

Figure VII is a consolidated statement showing totals of the major income and expense accounts. It shows the account description and current year totals with appropriate percentages of total. Since the system is designed to have monthly entries and analysis, the current month account information is also shown. The last year's totals are stored and shown for comparative analysis by the user.

iv) Other Considerations

a) Program Capacity - the capacity of a program may be determined somewhat by the hardware storage capacity, particularly for record keeping programs. Make sure you find out what the limitations are for that particular program on the hardware you're contemplating buying. This refers to the number of transactions in an accounting program, the number of head of livestock, the number of fields and/or years of historic data, etc. It could be very frustrating, for example, to set up 90% of your livestock herd on a data disk and then find out the disk is full.

Other capacity limitations may be built into the program. These may reduce flexibility but may help the program operate quicker or at least simpler for the user. The limits set by the program designer are usually adequate for the targeted user, however, you should know what the limits are ahead of time.

Rule of Thumb: Purchase a program with at least 50% more capacity than you think you will need. This goes for hardware as well so you won't have to be buying again as soon as you increase your farm size a bit. Buying

much more capacity however, without good reason to believe you will use it, could be a waste.

b) Amount and Flexibility of Data Entry - The program should allow you to enter all of the important pieces of information you want to record. If it allows a lot more, you may be buying more than you need. Consider, however, that even though you didn't want to bother collecting certain data, now that you have a computer to analyze it, maybe it would be useful to do. For example: Most farms do not forecast a detailed budget, but some accounting programs will compare what you are actually doing to a budget if you've entered one. This comparison could be very useful. (See Figure VI)

The other consideration in regard to the extra information a program allows you to enter is "How much **Must** you enter?" If, in the example above, the program would not function without a budget to compare actual to, it may be making more work than you bargained for and that is not the purpose of a computer.

The flexibility feature is especially important for record keeping programs. The ability to add optional comments or extra facts which will help in analysis in the future and will add a personal touch to data on record, may be an important consideration.

c) Security of Information - Restrictions to entry involving passwords or some other technique to avoid someone else from entering wrong data or even seeing your information is particularly important for financial records. If you share your computer with other family members or neighbours, you don't want their information on your disk. Check what passwords, if any, are used and whether you can change them at will if others find out what your password is.

v) Cost - Throughout the evaluation process you will have to decide how much you are willing to pay for the various features or if you are prepared to accept the shortcomings of each program. In general, you will get what you pay for. If your demands are large, be prepared to pay the price.

F. Buy it - Live with it

At some point you must finally decide which program is the best for you now. Too many people seem to wait for the magic "state of the art" program to do everything perfectly. This will never be the case. Just like cars or tractors, new models are continuously being invented and improved and no one model is "state of the art" for very long.

Once you've bought a package, learn it well and don't continually compare it to new packages coming on the market. It will most likely continue to do the job you bought it to do for several years just like older models of other equipment on your farm. Until you need to change significantly, comparing your old

package to new ones will likely just cause more frustration than is worthwhile.

Like other tools you have considered buying, a computer system can become an indispensable farm management tool.

Appendix I

ACCESS PROTECTION

- In cases where a computer program is in a form where it could possibly be modified by the end user, the manufacturer may take steps to prevent such modification. These steps include things such as a system which clears the memory when the user tries to list the program, compressing or encoding the program to make it unreadable, or one of a number of other methods. While a perfect access protection scheme has yet to be invented, they usually prevent the average user from changing the program.

BACKUP

- A duplicate copy of a program or data for use if the working copy becomes unusable.

CATHODE RAY TUBE (CRT)

- A special vacuum tube, one end of which is coated with a fluorescent material. A stream of electrons is shot from an electron gun at the other end of the tube, striking the fluorescent material and making it glow (a television picture tube).

CHIP

- An integrated circuit mounted in a small plastic or ceramic case. So called because the integrated circuit is built on a thin slice or chip of silicon or other similar material. See Integrated Circuit.

COMPUTER

- A mechanical, electromechanical or electronic device capable of storing, retrieving and manipulating data according to a program.

COPY PROTECTION

- In order to protect illegitimate copying of their programs, many manufacturers allow the purchaser of a program a limited number of copies for his own use, and modify the diskettes to prevent any further copies being made. This practice is becoming less common among the better programs, with the realization that any copy protection system will eventually be broken, and that copy protection hinders the legitimate user.

DEFAULT

- A value, specified by a program which may be used instead of entering a user-specified value.

DISK DRIVE

- A mass storage device used to read and write data to and from a floppy or hard disk. A peripheral input/output device.

DISKETTE

- The flexible magnetic media on which program and data files are permanently stored.

DISPLAY

- The image on the TV monitor by which the computer communicates messages to the user.

DOCUMENTATION

- The instruction manuals and materials that are part of the software and/or hardware, provided for the benefit of the person running the computer.

DOS

- Disk Operating System- a set of programs and utilities that allows the user to communicate with the hardware. It keeps track of files and memory, and manages input and output of data. In short, it manages all the resources of a computer system.

FILE	- A group of related records which are normally stored in some logical order.
FLOPPY DISK	- A thin, circular sheet of mylar plastic, coated with an iron-oxide compound, enclosed in a protective jacket. A floppy disk is used in a disk drive to store data.
HARDWARE	- The actual physical parts of a computer system, eg., the keyboard, printers, disk drives, monitor (screen) and central processor.
INPUT ROUTINE	- The input routine is a program in the operating system or in the main program which takes the keystrokes entered by the user and converts them into a form usable by the remainder of the program.
INTEGRATED CIRCUIT (IC)	- An electronic circuit made up of many components built on or into a small wafer of chip of semiconducting material, usually silicon.
INTELLIGENT TERMINALS	- Terminals connected to a large computer. These terminals have the capability to manipulate data. A microcomputer can be a very good intelligent terminal.
KEYBOARD	- A peripheral device used to input data into a computer.
MEMORY	- Numbers, letter, characters (data) and instructions are held in temporary storage in the computer called RAM-random access memory).
MENU	- A menu is a list of possible actions in a computer program from which the user can select one. A program which uses many menus is said to be "menu driven", and is generally easier to use but slower than other methods of controlling a computer program.
ON-LINE	- Something is considered to be "on-line" when it is ready for immediate use by the computer. On-line documentation or help is assistance in operating a program which is available on the computer without having to search through a manual. A printer is "on-line" when it is ready to accept input from the computer.
PROGRAM	- A series of instructions used by the computer to carry out a specified task.
PROGRAMMING LANGUAGE	- The machine language used by computers cannot be read or written by people. As a result, many different "languages" have been developed with which to write computer programs. These are then translated into machine language by another computer program. These languages try to put the operations of the computer into terms as convenient as possible for the programmer. Common languages for microcomputers include BASIC, PASCAL, AND COBOL.
SOFTWARE	- All the programs, operating systems, computer languages and instruction manuals that are part of a computer system.
SYSTEM	- A system in computer terms has two meanings. It either refers to a set of programs and associated data files that make up a purchased program, or it may also refer to the total combination of hardware and software that make up a single unit.
TRANSISTOR	- A electronic device which amplifies electricity by controlling the flow of electrons. A transistor acts as an on-off switch in computers by controlling the flow of electricity.
VDT	- Video Display Terminal. Is similar to a T.V. screen.

VERSION

- Computer programs are constantly undergoing improvement and error correction. In order to identify the earlier and later versions of a program, the practice of version numbers has become standard. A newly developed program will be called version 1.0 with each minor correction or change in the program, the digit after the decimal point is changed, to version 1.1, 1.2, 1.3, etc. When a major change is made to the program (usually when the program is rewritten) the digit before the decimal point is changed, i.e., version 2.0, 3.0, 4.0, etc.

Appendix II - General Applications Software Evaluation Checklist

The following form covers three major areas to be checked when evaluating software and you may wish to use these for your initial evaluation.

Meeting Information Need

1. Is there adequate user documentation?	Yes	No
2. Does the program appear to be easy to use?	Yes	No
3. List the most important characteristics of this application (Input data and output requirements)	Does this program possess these characteristics	
a. _____	Yes	No
b. _____	Yes	No
c. _____	Yes	No
d. _____	Yes	No
e. _____	Yes	No
f. _____	Yes	No
g. _____	Yes	No
h. _____	Yes	No
i. _____	Yes	No
j. _____	Yes	No
k. _____	Yes	No
l. _____	Yes	No
m. _____	Yes	No
n. _____	Yes	No
o. _____	Yes	No
4. Is the initial cost a license fee?	Yes	No
5. What is the cost of the total package?	Yes	No

Hardware Requirements

1. Brand and model of computer required.	_____
2. RAM required (number of K)	_____
3. Operating system required (include version)	_____
4. Programming language (include release number)	_____
5. Number (& type) of disk drives required	_____
6. Amount of secondary memory required	_____
7. Make and type of computer required	_____
8. Printer width required	_____
9. Type of monitor required	_____
10. Monitor size required	_____

Program Support

1. How is program delivered? (printed, tape, disk, etc.)
2. Can user documentation be purchased separately?
3. On-farm training provided?
4. Is there on-farm training available (include cost)?
5. Maintenance available? (Where, cost, etc)
6. Operational assistance available? (who, cost)
7. Are software enhancements available? (where, costs)
8. Number of years vendor in business?
9. How well does the vendor know the package?
10. What quality of support will you receive?

Appendix III - Sources of Information

Primary Software Manufacturers in Western Canada

- | | |
|---|---|
| <ol style="list-style-type: none">1. CAPA/Dunstat
3004 Taylor Street East
Saskatoon, Saskatchewan
S7H 4J2
306-373-34442. Digipae Microcomputer Software
907 River Street East
Prince Albert, Saskatchewan
S6V 0B3
306-764-1707 | <ol style="list-style-type: none">3. Homestead Computer Services Ltd.
2979 Pembina Highway
Winnipeg, Manitoba
R3T 2H54. Settler Computer Technologies
101 C Hodsman Road
Regina, Saskatchewan
S4N 5W5
306-949-9393 |
|---|---|

Some of the above manufacturers have extensive dealer networks. Other software manufacturers may exist in Western Canada particularly for specialty programs.

Note: An increasing number of programs manufactured in the United States are becoming available through distribution networks in Saskatchewan. A list of U.S.A. manufactured Farm Programs, is now available in booklet form. Contact:

Agricultural Computing Directory
c/o Doane Publishing
11701 Borman Drive
St. Louis, Missouri 63146

Cost \$10.95

Agricultural Computer Publications

Canadian

1. "Compu-Farm" Newsletter - monthly "How to Select the Right Farm Accounting Software for your Microcomputer" - Bulletin - Publication January 1984

Contact: Albert Agriculture
Farm Business Management Branch
Box 2000
Olds, Alberta
T0M 1P0
403-556-4240

Cost - Free

2. "Evaluating Computers for Farm Use" - Course Manual 1984

Contact: Wascana Institute
335 Maxwell Cres.
Regina, Saskatchewan
S4P 3A3
306-565-4003

Cost - \$6.00

3. "Agricultural Computer Extension Newsletter"

Contact: Ridgetown College of Ag. Tech.
Main Street East
Ridgetown, Ontario
N0P 2C0
519-674-5456

Cost - Free 6 issues per year.

American

1. Doane's "Agricultural Microcomputing Newsletter"

Contact: Doane Publishing
11701 Borman Drive
St. Louis, Missouri 63146

Cost - ?

2. Successful Farming "Farm Computer News"

Contact: Locust at 17th
Box 10231
Des Moines, Iowa 50380-0231

Cost \$32/year Canada 12 issues/year

3. "Agricomp" - Magazine

Contact: 103 Outdoors Buildings
Columbia, Mo. 65201
Cost - \$29/year Canada 6 issues/year